

PATENT ATTRIBUTION TO EQUITY RETURNS

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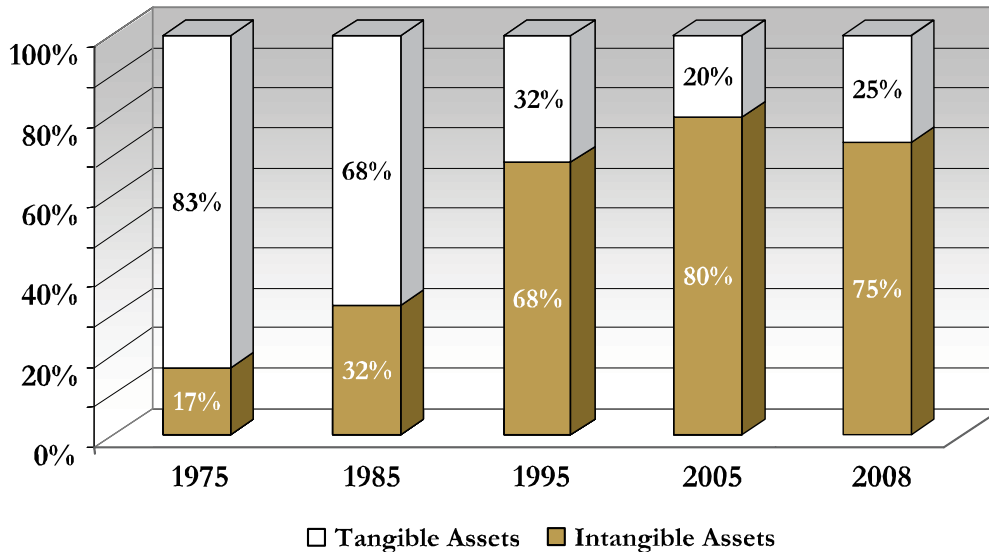
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In the summer of 2007 Ocean Tomo responded to a U.S. Department of Commerce request for public comment on issues related to the measurement of innovation. This white paper supplements and further supports the 2007 response through an attribution of patent value to returns of public companies. Our conclusion based on current reporting is that on a normalized basis patents are responsible for approximately one-quarter (22.5%) of the market capitalization of the S&P 500. We would expect similar results for other major market indexes except for the Ocean Tomo 300® Patent Index which reflects a higher rate of patent attribution.

Innovation is the design, invention, development and/or implementation of new or altered products, services, processes, systems, organizational structures, or business models for the purpose of creating new value for customers and financial returns for the firm. Unfortunately, most of the statistical measurements that are currently used to measure innovation are based upon the labor and industrial economy that the United States was in and have not adapted to the knowledge economy that the United States is in now.

As the U.S. economy has transformed from a manufacturing base to a service base driven by knowledge and innovation, intellectual capital has emerged as a leading asset class. The term intellectual capital refers generally to the value of a company's intangible assets, including those assets traditionally referred to as intellectual property – patents, trademarks and copyrights. During the transformation, the portion of company value residing in intangible and tangible assets has reversed. As shown below, intangible value as a percentage of market value grew from 17% in 1975, to 32% in 1985, to 68% in 1995, and to 80% in 2005. Following the (on-going) credit crisis correction in the final quarter of 2008, intangible assets fell slightly to 75% of market capitalization. We anticipate further but modest adjustment once all asset write downs are recorded in the first half of 2009.

Components of S&P 500 Market Value



Source: Ocean Tomo

FIGURE 1

To better understand this economic inversion and the relative contribution of intangible and tangible assets to innovation, economy-wide and sector-specific statistical measures of intangible assets are needed. Such is the subject of efforts by the *Measuring Innovation in the 21st Century Economy Advisory Committee* advising The U.S. Department of Commerce.

Our hypothesis was that innovation is directly reflected in the market's measure of intangible assets and largely embodied in patents. Any attribution to patents specifically cannot be measured by a simple count. Stated directly, patents are the single most fundamental measure of innovation but only recently has the private sector developed sufficient metrics to support the inclusion of patent quality and value measurements as a relevant statistic. Such metrics can now be found in the PatentRatings® systemⁱ which is itself evidenced through the various Ocean Tomo equity indexes listed on the New York Stock Exchange: the Ocean Tomo 300® Patent Index (NYSE Euronext: OTPAT), the Ocean Tomo 300® Patent Growth Index (NYSE Euronext: OTPATG) and the Ocean Tomo 300® Patent Value Index (NYSE Euronext: OTPATV)ⁱⁱ (collectively the "OT Indexes"). Such metrics reflect core patent statistics, such as the number of in-force U.S. utility patents owned, the average age of these in-force patents, and the number of patents abandoned. These metrics measure patent quality by employing forward citation analysis for patents owned by each company and calculate trends in a company's patents relevant to the health of its patent portfolio through a determination of an obsolescence or decay rate for each company's patent portfolio. Measures showing the technological concentration or diversification of each company's patent portfolio are also considered. Further detail is provided at www.PatentRatings.com.

The OT Indexes suggest that over a fifteen year period, on average, a 10% increase in the value of a company's Innovation Ratio, defined as the ratio of a company's patent value as shown by the PatentRatings® analytics to its book value, leads to a 7% increase in its stock price. This experience along with strong comparative performance suggested further analysis to specifically measure the portion of a company's total intangible value (as shown on Figure 1) attributable to that company's patent portfolio. To our understanding, such analysis has not been published previously.

Our attribution analysis began by charting industry relative Earnings Yield (calculated as Earnings / Market Capitalization) or the inverse of PE ratio to normalized patent signals as used in the OT Indexes. See Figure 2 below.

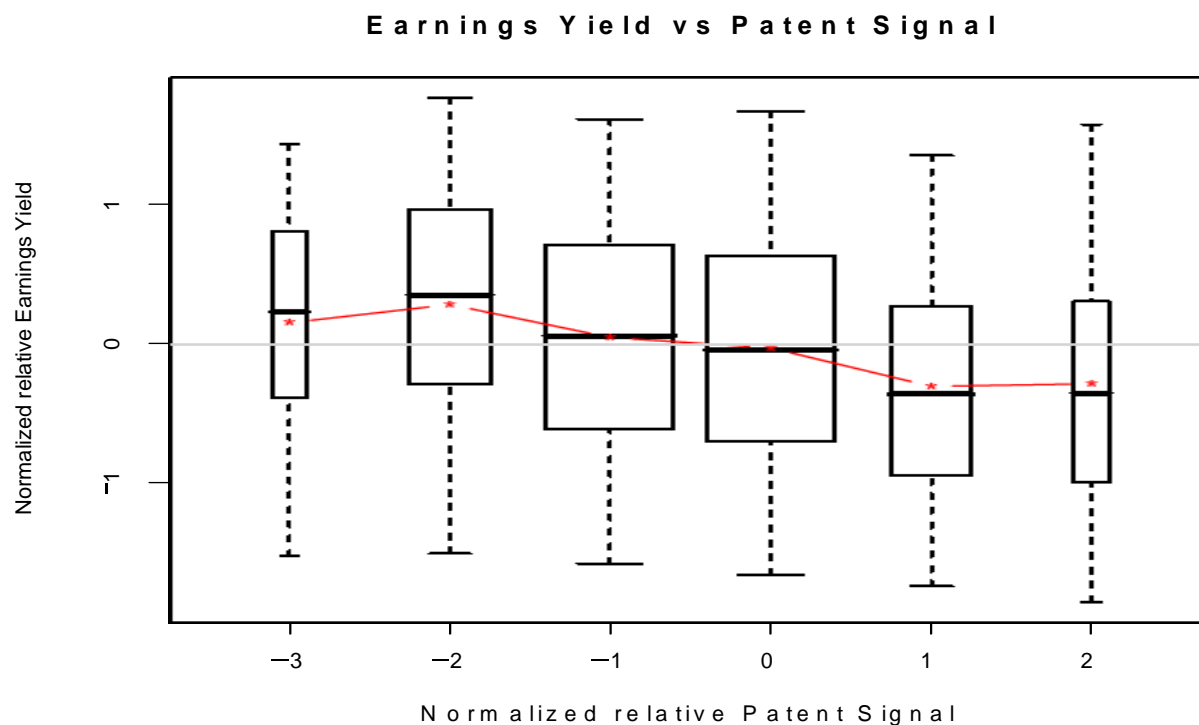


FIGURE 2

Relying on the process developed for Ocean Tomo's internal market neutral funds, we normalized the patent signal by company size, style and industry. We further normalized the relative earnings yield by industry. Analysis showed that there exists a statistically significant relationship between the above two measures wherein companies with higher patent value signals show lower Earnings Yield and therefore a higher valuation multiple.

Our study covered the period July 1996 through 2008 and showed that a strong patent signal resulted in a thirty percent increase in reported P/E multiples. This was measured by sorting the S&P 500 firms by the normalized patent signal and comparing the median P/E ratio of the top 250 companies to the same for the bottom 250 firms. Knowing that intangibles represent 75% of market capitalization of the S&P 500, thirty percent of this amount or 22.5% of total market capitalization may be fairly attributable to patent value for companies holding all else constant. Interestingly, such estimates confirm our anecdotal experiences from numerous detailed client investigations.

The economic inversion reflected by Figure 1 represents perhaps the largest single macro-economic impact to the US economy in the last quarter century. This change is permanent and its reflection is wholly lacking in current accounting and securities reporting. It is also reflective of a fundamental shift in the role innovation plays in the economy. Simply put, innovation is no longer limited to a supporting role in value creation, in many cases it is the product itself.

The cumulative value of all patents can accommodate the measurement of an economy-wide notion of innovation and the value of all patents within a sector can accommodate a sector-specific notion of innovation. Most importantly, the reported measurements are based on existing data sets and are already in market and are the foundation of direct metric based investment decisions.

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ⁱ The Ocean Tomo PatentRatings® system is a patented algorithm (See: US6556992) which measures the relative value of patent portfolios by employing sophisticated statistical techniques based on patent survival analysis. This analysis is distilled into an intellectual property quotient, or IPQ® Score, which reflects the probability that a patent will be maintained or abandoned. IPQ Scores function like FICO risk scores do for consumer credit. A patent's IPQ Score can be converted into an implicit patent value expectation, allowing for the straightforward calculation of the relative value of a company's patent portfolio on a weekly basis.

ⁱⁱ The Ocean Tomo 300® Patent Index is based on the 300 companies with the best patent portfolios, as assessed by Ocean Tomo, relative to their tangible book value. Prior to the PatentRatings® system, it was effectively impossible to reliably and reproducibly value a company's intellectual property. The use of this system and the Index constituent selection process together make the Ocean Tomo indexes an effective and reliable measure of the economy-wide impact of innovation. Although relative performance is secondary to our recommendation that the indexes be a considered economic indicator, strong comparative performance does reinforce the relevance of the indexes as a measure of economic growth and innovation.